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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,427	09/28/2006	Seiichi Tamura	03500.109226.	8692
5514 7590 10/20/2008 FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112				
EXAMINER				
CHIU, TSZ K				
ART UNIT		PAPER NUMBER		
2822				
MAIL DATE		DELIVERY MODE		
10/20/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/599,427

**Applicant(s)**

TAMURA ET AL.

**Examiner**

Tsz K. Chiu

**Art Unit**

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)  
Paper No(s)/Mail Date 9/10/08
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office Action is response to a Non-Final Rejection dated: April 2, 2008. The Examiner recognize that claim 3 is cancelled, claim 1, 2, 5 and 6 are amended claims, Claim 7 and 8 are newly proposed claim.

#### ***Drawings***

Figures 7 and 8 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirao et al. (4791070).

With respect to claim 1, Hirao discloses

a plurality of pixels arranged in a pixel region, each pixel including a photoelectric conversion region (21,31,2, For example Fig. 8G) for converting light into signal charge, and a peripheral circuit arranged outside of said pixel region and including a circuit for processing said signal charge, the pixels and peripheral circuit being disposed together on a substrate wherein the photoelectric conversion region includes

a first semiconductor region (31) of a first conductivity type ("n+");

a second semiconductor region (21) of a second conductivity type ("p") that is opposite to said first conductivity type, and that is disposed in the first semiconductor region for accumulating said signal charge;

a third semiconductor region (1) of the first conductivity type ("n") and comprising said peripheral circuit;

wherein the impurity concentration of said first semiconductor region (31) is higher than the impurity concentration of said third semiconductor region (1).

Hirao did not disclose the process of circuit converting light into signal charge and processing said signal charge, however, according to the MPEP, Section 2113, Even though product-by-process of using claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

With respect to claim 2, Hirao discloses

a plurality of pixels arranged in a pixel region, each pixel including a photoelectric conversion region (21,31,2, For example Fig. 8G) for converting light into signal charge, and a peripheral circuit arranged outside of said pixel region and including a circuit for processing said signal charge, the pixels and peripheral circuit being disposed together on a substrate wherein the photoelectric conversion region includes

a first semiconductor region (31) of a first conductivity type ("n+");

a second semiconductor region (21) of a second conductivity type ("p") that is opposite to said first conductivity type, and that is disposed in the first semiconductor region for accumulating said signal charge;

a third semiconductor region (1) of the first conductivity type ("n") and comprising said peripheral circuit;

wherein the peak impurity concentration of said first semiconductor region (31) is higher than the peak impurity concentration of said third semiconductor region (1).

Hirao did not disclose the process of circuit converting light into signal charge and processing said signal charge, however, according to the MPEP, Section 2113, Even though product-by-process of using claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

With respect to claim 4, Hirao discloses invention set forth to claim 1, however Hirao did not discloses the different impurity concentration between the photoelectric

region and the CMOS device however , it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the different impurity concentration in one region than the other region, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. (1955)

With respect to claim 5-6, Hirao discloses first semiconductor region (18) has a structure wherein plural semiconductor regions having impurity concentration peaks disposed in a depth direction inside said substrate (11, For example Fig. 8), and the impurity concentration of the impurity concentration peak disposed in the deepest portion is higher-than the impurity concentration of the impurity concentration peak disposed at said photoelectric conversion device (21,31,2, For example Fig. 8G), however , it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the different impurity concentration in one region than the other region, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233. (1955).

With respect to claim 7-8, Hirao discloses

a plurality of pixels arranged in a pixel region, each pixel including a photoelectric conversion region for converting light into signal charge, and a peripheral circuit arranged outside of said pixel region and including a circuit for processing said signal charge, the pixels and peripheral circuit being disposed together on a substrate wherein the photoelectric conversion region includes

a first semiconductor region (31) of a first conductivity type ("n+");

a second semiconductor region (21) of a second conductivity type ("p") that is opposite to said first conductivity type, and that is disposed in the first semiconductor region for accumulating said signal charge;

a third semiconductor region (1) of the first conductivity type ("n") and comprising said peripheral circuit;

wherein said first semiconductor region (31) has a structure wherein plural semiconductor regions having impurity concentration peaks are disposed in a depth direction inside said substrate (1),

the impurity concentration of the impurity concentration peak disposed in the deepest portion is higher than the impurity concentration of the impurity concentration peak disposed at said photoelectric conversion device side (21,31,2, For example Fig. 8G), and

the impurity concentration of said impurity concentration peak disposed in the deepest portion of said first semiconductor region (31) is higher than the impurity concentration of said impurity concentration peak of said third semiconductor region (1)

wherein said impurity concentration peak disposed in the deepest portion of said first semiconductor region (31) is deeper than an impurity concentration peak of said third semiconductor region (1).

Hirao did not disclose the process of circuit converting light into signal charge and processing said signal charge, however, according to the MPEP, Section 2113, Even though product-by-process of using claims are limited by and defined by the

process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tsz K. Chiu whose telephone number is 571-272-8656. The examiner can normally be reached on 0800 to 1700.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra V. Smith can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Zandra V. Smith/  
Supervisory Patent Examiner, Art  
Unit 2822

TC